

## ABSTRACT

The present invention relates to a process for producing an epitaxial layer of gallium nitride (GaN) as well as to the epitaxial layers of gallium nitride (GaN) which can be obtained by said process. Such a process makes it possible to obtain gallium nitride layers of excellent quality by (i) forming on a surface of a substrate, a film of a silicon nitride of between 5 to 20 monolayers, functioning as a micro-mask, (ii) depositing a continuous gallium nitride layer on the silicon nitride film at a temperature ranging from 400 to 600°C, (iii) after depositing the gallium nitride layer, annealing the gallium nitride layer at a temperature ranging from 950 to 1120°C and (iv) performing an epitaxial regrowth with gallium nitride at the end of a spontaneous *in situ* formation of islands of gallium nitride.